

WHAT IS CLAIMED IS:

1. An air conditioner for a vehicle having a passenger compartment, the air conditioner comprising:

a main blower for blowing air;

a heat exchange unit for performing heat exchange with air blown by the main blower;

a case for accommodating the heat exchange unit, the case having a first passage through which conditioned air after being heat-exchanged with the heat exchange unit flows toward a first area in the passenger compartment, and a second passage through which conditioned air after being heat-exchanged in the heat exchange unit flows toward a second area in the passenger compartment;

a connection duct through which conditioned air in the second passage is introduced to the second area of the passenger compartment, the connection duct being connected to the second passage such that an air flow resistance in the second passage becomes larger than an air flow resistance in the first passage; and

a sub-blower disposed integrally with the case, for blowing conditioned air in the second passage toward the second area of the passenger compartment.

2. The air conditioner according to claim 1, wherein:

the heat exchange unit includes at least a heating heat exchanger for heating air; and

the second passage includes a hot air passage through

which air after passing through the heating heat exchanger flows, and a cold air passage through which air bypassing the heating heat exchanger flows, the air conditioner further comprising

a temperature adjustment unit disposed to adjust an air amount flowing through the hot air passage and an air amount flowing through the cold air passage to adjust a temperature of the conditioned air to be blown to the second area in the passenger compartment,

wherein the sub-blower is disposed downstream of the temperature adjustment unit.

3. The air conditioner according to claim 1, wherein:

the cold air passage is provided at a lower side of the heating heat exchanger;

the hot air passage is provided at an upper side of the cold air passage; and

the sub-blower is disposed at a lower side portion in the case.

4. The air conditioner according to claim 1, wherein:

the heat exchange unit includes at least a heating heat unit for heating air;

the sub-blower is disposed directly downstream of the heating heat exchanger at a lower side portion in the case.

5. The air conditioner according to claim 1, wherein the

sub-blower is constructed with a centrifugal blower fan and a driving motor for driving the centrifugal blower fan.

6. The air conditioner according to claim 5, wherein:

the driving motor is a double shaft type having two rotary shafts protruding to two sides in an axial direction; and

the blower fan includes two centrifugal fans disposed at the two outsides of the rotary shafts in the axial direction to be connected to rotary shafts.

7. The air conditioner according to claim 5, wherein:

the blower fan is arranged such that its axial direction is in a vehicle right-left direction;

the driving motor is arranged at an outer peripheral side of the blower fan; and

the sub-blower further includes a rotation transmission unit through which a rotation of the driving motor is transmitted to the blower fan.

8. The air conditioner according to claim 1, wherein the sub-blower is constructed with a cross flow fan and a driving motor for driving the cross flow fan.

9. The air conditioner according to claim 1, wherein:

the first area is a front seat area in the passenger compartment;

the first air passage is a front air passage through which air flows toward the front seat area;

the second area is a rear seat area in the passenger compartment; and

the second air passage is a rear air passage through which air flows toward the rear seat area.

10. The air conditioner according to claim 9, further comprising:

a front temperature adjustment unit that adjusts temperature of air blown from the front air passage; and

a rear temperature adjustment unit that adjusts temperature of air blown from the rear air passage, wherein:

the heat exchange unit includes at least a heating heat exchanger for heating air;

the rear temperature adjustment unit is disposed to adjust a flow ratio between hot air after passing through the heating heat exchanger and cold air bypassing the heating heat exchanger, in the rear air passage; and

the sub-blower is disposed at a downstream side of the rear temperature adjustment unit in the rear air passage.

11. The air conditioner according to claim 1, wherein:

the rear air passage includes a rear hot air passage through which air after passing through the heating heat exchanger flows, and a rear cold air passage through which air bypassing the heating heat exchanger flows;

the rear temperature adjustment unit includes a rear hot air door for adjusting a passage area of the rear hot air passage, and a rear cold air door for adjusting a passage area of the rear cold air passage;

in a maximum heating state of the rear seat area, the rear hot air door fully opens the rear hot air passage, and the rear cold air door fully closes the rear cold air passage;

in a maximum cooling state of the rear seat area, the rear hot air door fully closes the rear hot air passage, and the rear cold air door fully opens the rear cold air passage; and

in a temperature adjustment state of the rear seat area between the maximum heating state and the maximum cooling state, one of the rear hot air door and the rear cold air door is operated to increase the passage area, and the other one of the rear hot air door and the rear cold air door is operated to decrease the passage area.

12. The air conditioner according to claim 11, wherein the rear hot air door and the rear cold air door are disposed to set a rear shut state where the rear hot air door fully closes the rear hot air passage and the rear cold air door fully closes the rear cold air passage.

13. The air conditioner according to claim 11, wherein the rear hot air door and the rear cold air door are arranged at a side of a suction port of the sub-blower in an axial

direction of the sub-blower.

14. The air conditioner according to claim 13, wherein:
each of the rear hot air door and the rear cold air door
is a plate door rotatable in a rotation space; and

the rear hot air door and the rear cold air door are
disposed such that its rotation spaces are positioned at an
inner peripheral side of the suction port.

15. The air conditioner according to claim 13, wherein
the rear hot air door and the rear cold air door are film
doors moved along opening surfaces of the rear hot air passage
and the rear cold air passage.

16. The air conditioner according to claim 10, wherein:
the heating heat exchanger is disposed in the case to
form a rear cold air passage at a lower side of the heating
heat exchanger, and a front cold air passage at an upper side
of the heating heat exchanger; and

the front temperature adjustment unit is disposed to
adjust a flow ratio between air passing through the heating
heat exchanger in the front air passage and air passing
through the front cold air passage.

17. The air conditioner according to claim 10, wherein
the case further has therein a seat cold air passage into
which air branched from the rear cold air passage flows, and a

seat hot air passage into which air after passing through the heating heat exchanger flows, the air conditioner further comprising

a seat temperature adjustment unit for adjusting a flow ratio between air from the seat hot air passage and air from the seat cold air passage to adjust a temperature of conditioned air to be blown into a seat in the passenger compartment.

18. The air conditioner according to claim 17, wherein:

the rear hot air passage, the rear cold air passage and the rear temperature adjustment unit are provided in a center area of the case in a vehicle right left direction; and

the seat cold air passage, the seat hot air passage and the seat temperature adjustment unit are provided at right and left outsides of the rear warm air passage, the rear cold air passage and the rear temperature adjustment unit in the vehicle right-left direction.

19. The air conditioner according to claim 10, wherein:

the rear air passage is branched downstream of the sub-blower, into a rear face passage through which air is blown toward a rear upper side in the rear seat area of the passenger compartment, and a rear foot passage through which air is blown toward a rear lower side in the rear seat area of the passenger compartment; and

the rear air passage includes a rear bypass passage

through which a part of air at an upstream portion upstream from the rear temperature adjustment unit is directly introduced into any one of rear face passage and the rear foot passage.

20. The air conditioner according to claim 19, further comprising

a rear bypass door that changes a passage area of the rear bypass passage.

21. The air conditioner according to claim 19, wherein the rear bypass passage has an outlet portion that is joined to a pressure reducing portion in which an air pressure is reduced due to an air flow of the sub-blower.

22. The air conditioner according to claim 19, wherein the rear bypass passage is a rear cold air bypass passage through which a part of cold air in the rear cold air passage at the upstream portion of the rear temperature adjustment unit is directly introduced to the rear face passage.

23. The air conditioner according to claim 19, wherein the rear bypass passage is a rear hot air bypass passage through which a part of hot air in the rear hot air passage at the upstream portion of the rear temperature adjustment unit is directly introduced to the rear foot passage.